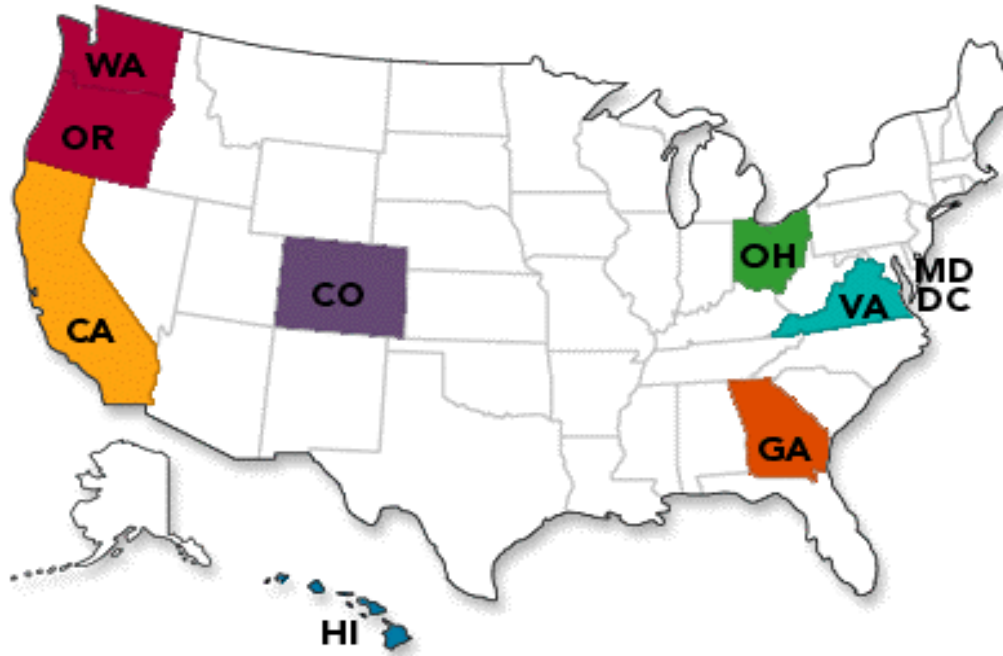


ePrescribing at Kaiser Permanente

David Campen, M.D.
TPMG Medical Director Pharmacy
November 20, 2008

Kaiser Permanente's Prescriptions By the Numbers



- >60 million prescriptions written and filled annually (nationally)
- For >6.5 million unique members, or >130,000 daily, in CA
- Nearly all prescriptions done electronically
- Generic use rate of >83% (>85% under Part D) in California
- >99.5% when generic is available
- >98% formulary prescribing –
- Open exception process
“No 1-800 Mother may I?”

Objectives

- Identify the benefits of the ePrescribing at Kaiser-Permanente
- Review ePrescribing workflows including Physician Order Entry, medication verification, drug interaction checking, refill management and weight based dose checking that enhance patient safety and compliance
- Discuss review tools for patient engagement in helping to manage their own healthcare

KP Standardized Order Entry

EpicHyperspace - SCH-RHE1 >MAIN CAMPUS - Production - HCNCPRODSBM PRODSBM

Desktop Action Patient Care Scheduling Reg/ADT CRM/CM Reports Report Mgmt Tools Admin Help

Back Forward Home Schedule In Basket Chart Enc Tel Enc Refill Enc Ancil Ord Enc Patient Lists Secure Print Log Out

Epic Home

MRN Age Sex PCP Allergies Alert Spec Feat kp.org
71 Y F Lisinopril, Eggs (edible), Cozaar PrtD Inactive

Snapshot
Chart Review
Results Review
Allergies
Medications
Flowsheets
Problem List
History
Letters
Demographics
Scan
CIPS
Patient Report
Order Entry
Imm/Injections
Doc Flowsheet
Forms
eConsult
Refill Encounter

Order Entry (Enc Date: 11/17/2008) - Wt: (Not entered for this visit) Ht: (Not entered for this visit)

Association Pref List SmartSets Interactions Pharmacy Providers References Open Orders Pend Orders Sign Orders Financial Routing Drugs eConsult

Order: ☒ Both ☐ Medication ☐ Procedure

This patient has open orders.

Full Detail (F4)

Take	Req	F/S	Order	Dx	Detail
------	-----	-----	-------	----	--------

New Order Status Modifiers Cancel/Delete Select All Med Class Benefit CC Results ☒ Show placed orders F7 - Prev order F8 - Next order

Association: Selected Grid Auto Clear Replace LOS:

Diagnosis:

P Encounter Diagnoses (right-click dx for more options)

Add Add

Link	Problem List (right-click problem for more options)	Status
	RHEUMATOID ARTHRITIS [714.0B]	Active
	HYPERTENSION [401.9A]	Active
	OBESITY [278.00E]	Active

New Dx Delete Dx Annotate/Edit Dx Primary Dx

New Problem Edit Problem Resolve Now ☐ Show resolved

Hotkey List

KP Standardized Order Entry

- Fully electronic system
- 130,000 Prescriptions electronically transmitted directly to pharmacy computer system **every day**
- **NO** Faxes, No Transcription
- Only paper Rx's are for outside fills and for DEA Schedule 2 Drugs
- Linked tightly to fully electronic Medical Record
- Implemented in both Inpatient and Ambulatory

Order Entry – Medication Review

EpicHyperspace - SCH-RHE1 >MAIN CAMPUS - Production - HCNCPRODSBM PRODSBM

Desktop Action Patient Care Scheduling Reg/ADT CRM/CM Reports Report Mgmt Tools Admin Help

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MRN Age Sex PCP Allergies Alert Spec Feat kp.org
71 Y F Lisinopril, Eggs (edible), Cozaar PrtD Inactive

Snapshot
Chart Review
Results Review
Allergies

Medications

Med Notes New Rx Reorder/Change Rx Discontinue Reviewed Mark All Clear Filters Filters

As of now History

Prescription summary for this Visit (11/17/2008)

Medication	Sig	Disp	Refills	Ord/Sold Date	End Date	DAW	Co
HYDROCHLOROTHIAZIDE 25 MG ORAL TAB	Take 1 tablet orally daily for blood pressure control	100	2/3	09/19/2008 (S)	12/16/2009	No	
ATENOLOL 50 MG ORAL TAB	Take 1 tablet orally daily for blood pressure control	100	2/2	09/19/2008 (S)	12/16/2009	No	
METHOTREXATE SODIUM 2.5 MG ORAL TAB	Take 6 tablets orally every week for arthritis. DO LABS MONTHLY	60	0/1	09/11/2008 (S)	12/10/2009	No	
NEOMYCIN-POLYMYXIN-HC 3.5-10,000-1 MG-UNIT/ML-% OTIC SOLN	Instill 1 drop into each ear daily for itching	10	2/2	02/27/2008 (S)			

Current Active Medications

Medication List Comments

< Last reviewed on 2/25/2008 2:14 PM by ARLEEN NG MD >
< No filters applied.

Hotkey List
Exit Workspace

"S" Identifies that Rx sold

Rapid Access to Additional Rx Information

The screenshot displays the Epic Hyperspace web application interface. The browser window title is "Epic Hyperspace - SCH-RHE1 >MAIN CAMPUS - Production - HCNCPRODSBM PRODSBM". The top navigation bar includes links for Desktop, Action, Patient Care, Scheduling, Reg/ADT, CRM/CM, Reports, Report Mgmt, Tools, Admin, and Help. Below this is a secondary navigation bar with icons for Back, Forward, Home, Schedule, In Basket, Chart, Enc, Tel Enc, Refill Enc, Ancil Ord Enc, Patient Lists, and Secure. The main content area is divided into three sections: "Schedule" (red header), "In Basket" (teal header), and "Links" (purple header). The "In Basket" section shows "Pt: Reminder" and "Staff Message". The "Links" section, under the "KAISER PERMANENTE" logo, lists various resources. The "Pharmacy Homepage" link is circled in red, and a red arrow points from a text box labeled "Pharmacy Homepage" to this link. The Windows taskbar at the bottom shows the start button and several open applications: WebEx One..., GoToMeeting..., Epic Hyperspace..., Internet..., and another GoToMeeting instance. The system clock indicates 9:40 AM.

Pharmacy Homepage

Links

- KAISER PERMANENTE®
- What's New/How To
 - > Ambulatory KPHC
 - > Inpatient KPHC
- Front Office
- KP National Clinical Content Website
- eConsult
- Clinical Library
- Clinical Images
- Physician Home Page Info Site
- Technology Group Website
- Departmental Reports
- Pharmacy Homepage**
- Rx Conversion
- PEDI BMI TOOL
- eDME
- Secure Messaging/Online

Clinical Decision Support

■ **Improved Monitoring** (linked to refilling)

- Medication Adherence
- Lab

■ **Alerts**

- Drug-Drug
- Drug-Allergy
- Formulary
- Weight Based Dosing (Pediatrics)

■ **Structured Order Sets**

- Inpatient
- Oncology

Medication Refills - Lab

EpicHyperspace - SCH-RHE1 >MAIN CAMPUS - Production - HCNCPRODSBM PRODSBM

Desktop Action Patient Care Scheduling Reg/ADT CRM/CM Reports Report Mgmt Tools Admin Help

Back Forward Home Schedule In Basket Chart Enc Tel Enc Refill Enc Ancil Ord Enc Patient Lists Secure Print Log Out

Epic Home

Rx: RAR - 1 New of 2

New Msg Refresh Sort Search Display Properties EZ Approve Refuse Reassign Approve Sign Edit Msg/Notes Flowsheet Review

In Basket
Pt. Reminder
Results (3)
Rx: RAR (1)
Chart: CC'd Chart
Remote In Basket Prev
Out Basket

P	Status	F/U	Date	Patient	Medication	Clas...	Rx Prescriber
	Pend						
	Pend		10/28/08		TOLAZAMIDE 250 MG ORAL TAB		Campen, David ...

Tolinese 250mg refill request

In Basket Hotkey List

Links Copy Refresh Print Resize

Rx Refill Response
Response

Action taken: Approve	Action by: CAMPEN, DAVID HOWARD (M.D.)	Date: 10/29/08	Time: 7:46 AM
Medication: TOLAZAMIDE 250 MG ORAL TAB			
Sig: Take 1 tablet orally 2 times a day for diabetes			
Refills approved: 5	Quantity: 200	End date: 1/28/10	

Rx Refill Request
Request

Patient:	Date: 10/28/08	Time: 9:07 PM
Medication: TOLAZAMIDE 250 MG ORAL TAB		
Sig: Take 1 tablet orally 2 times a day for diabetes		
Refills remaining: 0/5	Last refill: 10/28/08	End date: 1/28/10
Refills requested: 5	Quantity: 200	Pharmacy: LVR CPP/MAIL #253

Medication Refills - Lab

EpicHyperspace - SCH-RHE1 >MAIN CAMPUS - Production - HCNCPRODSBM PRODSBM

Desktop Action Patient Care Scheduling Reg/ADT CRM/CM Reports Report Mgmt Tools Admin Help

Back Forward Home Schedule In Basket Chart Enc Tel Enc Refill Enc Ancil Ord Enc Patient Lists Secure Print Log Out

Epic Home

Rx: RAR - 1 New of 2

New Msg Refresh Sort Search Display Properties EZ Approve Refuse Reassign Approve Sign Edit Msg/Notes Flowsheet Review

In Basket

- Pt. Reminder
- Results (3)
- Rx: RAR (1)
- Chart: CC'd Chart
- Remote In Basket Prev
- Out Basket

P	Status	F/U	Date	Patient	Medication	Clas...	Rx Prescriber
Pend	P		10/29/08				Campan, David ...
Pend			10/28/08		TOLAZAMIDE 250 MG ORAL TAB		Campan, David ...

Tolinase 250 mg refill request

In Basket Hotkey List

LAST LABS

LAST APC LAB:

WBC	12.4	12/13/2006
HCT	40.8	12/13/2006
HGB	14.2	12/13/2006
PLT	227	12/13/2006
CHOL	178	06/24/2008
HDL	28	06/24/2008
LDL CALC	NOT DONE	06/24/2008
TRIG	514	06/24/2008
CREAT	1.26	06/24/2008
K	4.7	01/02/2007
NA	141	01/02/2007
CO2	26	01/02/2007
CL	105	01/02/2007
PSA	2.0	02/01/2007
HGBA1C %	6.6	06/24/2008

Instantly check HbA1c

INTE®

10

Medication Refills - Adherence

EpicHyperspace - SCH-RHE1 >MAIN CAMPUS - Production - HCNCPRODSBM PRODSBM

Desktop Action Patient Care Scheduling Reg/ADT CRM/CM Reports Report Mgmt Tools Admin Help

Back Forward Home Schedule In Basket Chart Enc Tel Enc Refill Enc Ancil Ord Enc Patient Lists Secure Print Log Out

Epic Home

Age 62 Y Sex F Mult PCP Allergies Alert Spec Feat kp.org
 Campen, David Howard *Penicillins Class, Co-trimoxazole, Metho* PrtD Inactive

Snapshot
 Chart Review
 Results Review
Report Viewer
 Allergies
 Medications
 Flowsheets
 Problem List
 History
 Letters
 Demographics
 Scan
 CIPS
 Patient Report

Medication Report Close X

KAISER PERMANENTE

Medication TOLAZAMIDE 500 MG ORAL TAB

Medication Detail	Quantity	Refills	Start	End
TOLAZAMIDE 500 MG ORAL TAB Sig: Take 1 tablet orally 3 times a day Route: Oral Order #:	200	3/5	11/11/2008	2/11/2010

Order Providers

Prescribing Provider	Encounter Provider
David Howard (M.D.) Campen	David Howard (M.D.) Campen

Dispense Hx for This Rx #

Refill No.	Medication	Quantity	Refills Remaining	Date
3	TOLAZAMIDE 500 MG ORAL TAB	200	3	11/11/08
2	TOLAZAMIDE 500 MG ORAL TAB	200	4	9/10/08
1	TOLAZAMIDE 500 MG ORAL TAB	200	5	7/1/08

Order Release Information

Order Date and Time	Department
7/1/2008 5:56 PM	Sch-Rhe1 >Main Campus

Release Information

First Scheduled For	Released Date	Released By
1. Sun Nov 16, 2008 7:45 AM	Tue Jul 1, 2008 5:56 PM	User Pims

Hotkey List

Exit Workspace


Back Links Copy Refresh Print

All Inpatient Administrations of TOLAZAMIDE 500 MG ORAL TAB

Responses to DDI (and other) Alerts

- When a DDI alert fires, the provider can:
 - ✓ Accept the alert
 - Cancel the drug order the you just entered
 - Remove the drug order that was already present
 - ✓ Override the alert
 - Continue with original prescription; both drug orders remain active

Drug-Drug Interaction Alert

 **Medication Alerts**

Current Alerts

Group by ☒ Importance ☐ Type ☐ Orders ☐ Set as startup option ☒ Expand ☐ Collapse

Summary [N/A](#)

- Current

- Existing

- Ended

- Verified

- Given

Show Legend

Type	Significance	Description	Order(s)	Override Reason/Comment
N/A				
Allergy	Drug class...	<div><div>⊕</div><div>HYDROCHLOROTHIAZIDE</div><div>Reactions: None specified</div><div>Type: None specified</div><div>Comments: 2004-06-01;photosens. rash</div></div>	<div><div></div><div>CHLORTHALIDONE 25 MG ORAL TAB</div></div>	<div><div></div><div>Howard 11:23 AM. currently</div></div>

Override Reason

Comments

Override & Accept

Cancel

Immediately override and accept all alerts with this reason:

Benefits outweigh risks

Not clinically significant

Previously or currently tolerated

Low risk

Not a true allergy

Expected side effect

Level 1 DDI Alert Rates (KP NoCal 4Q07)

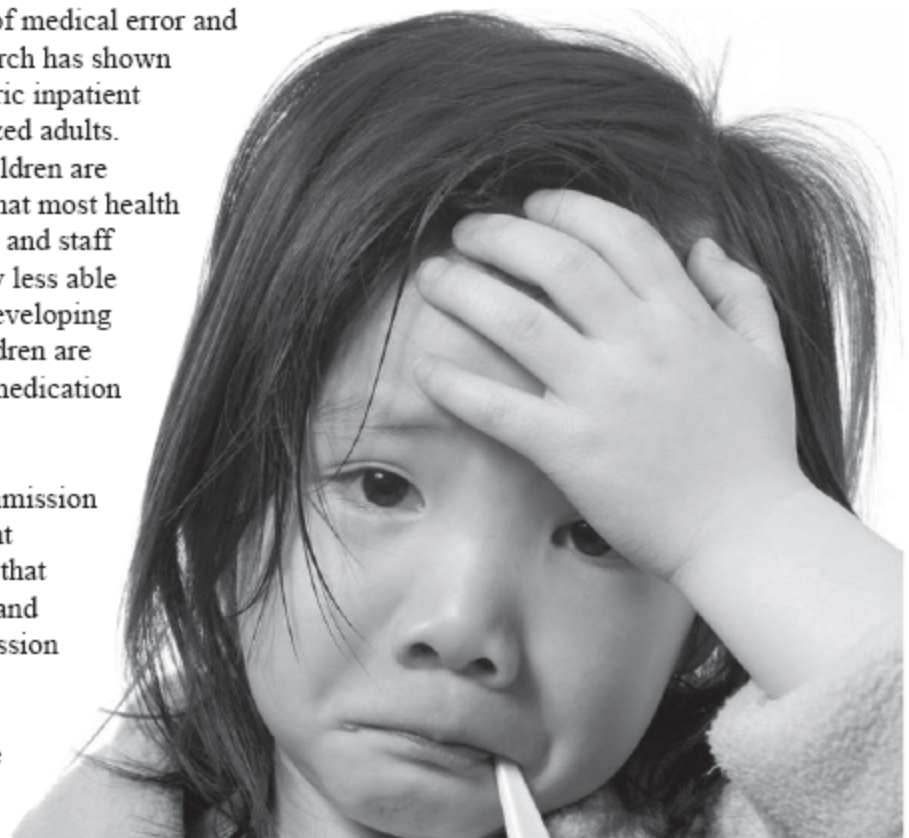
- Level 1 = Contraindicated unless managed
- 23,872 Level 1 DDI Alerts fired to prescribers
- 1 alert per 185 patient encounters
- 1 alert per 106 OP Rx orders
- **22% Accepted (4Q07)**
 - In 2005 (before analysis and promotion/demotion, only 15% accepted)

Pediatric Dosing Alerts

Working to Prevent Pediatric Medication Errors

Medication errors are seen as the most common type of medical error and as a significant cause of preventable adverse events. Research has shown that the potential for adverse drug events within the pediatric inpatient population is about three times as high as among hospitalized adults. One reason is that most medications used in the care of children are formulated and packaged primarily for adults. Another is that most health care settings are primarily built around the needs of adults, and staff often lacks pediatric-oriented training. Children are usually less able to physiologically tolerate a medication error due to still developing renal, immune and hepatic functions. And very young children are not able to effectively articulate the adverse effects that a medication may be causing.

To address pediatric medication issues, The Joint Commission issued a “Sentinel Event Alert” on April 11, 2008. The Joint Commission is an independent, not-for-profit organization that accredits and certifies more than 15,000 care organization and programs in the United States. The Joint Commission’s mission is to continuously improve the safety and quality of care provided to the public through the provision of healthcare accreditation and related services that support performance improvement in health care organizations.



Script July 2008 pg. 16

Pediatric Dosing Alerts

ff MRN Location Age: 12y Dx Allergies Ht: -- BSA: --
SACPED-PED-3B Sex: M Tonsillector* NO KNOWN ALLERGIES Wt: -- CrCl: --

Place orders Resize

New Order Interactions Providers Reports Pended/Held Pend Orders Sign & Hold Sign & Verify Sign Orders Order Set

Problem List
Selected Orders

New order: Search Next Edit Multiple...

Order mode: Standard Order defaults: Not using defaults

Medications (1)

Ampicillin IVPB 3 g (OMNIPEN-N) Remove

3,000 mg = 3 g, Intravenous, EVERY 6 HOURS, First Dose Today at 1600 Until Discontinued

F7- Prev Order F8- Next Order

Ampicillin Order 3gm every 6 hours for 12 year old

Pediatric Dosing Alerts

Medication Alerts

Current Alerts | Report

Group by ☒ Importance ☐ Type ☐ Orders ☐ Set as startup option ☒ Expand ☐ Collapse

Summary N/A (1)

● - New ■ - Existing ✗ - Ended ✓ - Verified G - Given [Show Legend](#)

Type	Significance	Description	Order(s)	Override Reason/Comment
N/A				
Dose	↑ Daily	<div style="border: 1px solid red; padding: 5px;">⊕ AMPICILLIN SODIUM 1 GRAM INJ RECON SOLN: exceeds recommended maximum daily dose by 50% (4,000 mg)</div>	● Ampicillin IVPB 3 g (OMNIPEN-N) Remove	<div>Dropdown menu</div> New (1)

- Built in warnings about maximum dosing alerts at time of order entry

Structured Orders Sets - Oncology

Treatment Plan Manager - ONCA BLADDER CISPLATIN GEMCITABINE Q4WEEK [666] Close X

Add
 Delete Selected
 Dose Reduction
 Change View
 Treatment Info
 D/C Plan
 Cumulative Dose
 Review Flowsheet

Treatment plan: Weight: 63.5 kg BSA: 1.71 m2 Documented weight as of 10/1/07 11:27 AM, height of 165.1 cm as of 10/1/07 11:27 AM
 Most recent: Weight: 63.5 kg BSA: 1.71 m2 Documented weight as of 10/1/07 11:27 AM, height of 165.1 cm as of 10/1/07 11:27 AM
 Difference: No change No change

Cycle	Day	Date	Status	Actions
Cycle 1		10/3/2007, Planned		
+ Day 1, Cycle 1		10/3/2007, Planned		Add Order Add Order Group Add Blank Day Copy Paste Delete Complete Day Defer Day Cancel Day
+ Day 8, Cycle 1		10/10/2007, Planned		
+ Day 15, Cycle 1		10/17/2007, Planned		
Cycle 2		10/31/2007, Planned		
Cycle 3				
Cycle 4				

Treatment Plan Manager - ONCA BLADDER CISPLATIN GEMCITABINE Q4WEEK [666] Close X

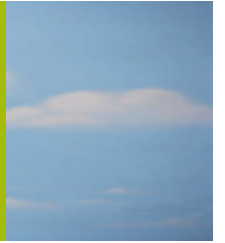
Add
 Delete Selected
 Dose Reduction
 Change View
 Treatment Info
 D/C Plan
 Cumulative Dose
 Review Flowsheet

Treatment plan: Weight: 63.5 kg BSA: 1.71 m2 Documented weight as of 10/1/07 11:27 AM, height of 165.1 cm as of 10/1/07 11:27 AM
 Most recent: Weight: 63.5 kg BSA: 1.71 m2 Documented weight as of 10/1/07 11:27 AM, height of 165.1 cm as of 10/1/07 11:27 AM
 Difference: No change No change

Cycle	Day	Date	Status	Actions
Cycle 1		10/3/2007, Planned		
+ Day 1, Cycle 1		10/3/2007, Planned		
Provider Reminders				
Orders				
APREPITANT 80 MG ORAL CAP		Take 1 capsule PO daily on days 2 and 3 after chemotherapy to prevent nausea and vomiting, Disp-2, R-0, Oral, starting S, Pharmacy - In formulary		
DEXAMETHASONE 4 MG ORAL TAB		Take 8 mg (2 tablets) PO daily days 2, 3, and 4 after chemotherapy to prevent nausea and vomiting, Disp-6, R-0, Oral, starting S, Pharmacy - In formulary		
Premedications				
Chemotherapy				
Gemcitabine IVPB 1.71 g		1,000 mg/m2 = 1.71 g, Intravenous, ONE TIME, 1 dose starting S at 0000 **Caution: Chemotherapy**		
Cisplatin 119.7 mg in Sodium Chloride 0.9 % 1,000		Intravenous, ONE TIME, 1 dose starting S at 0000		

Save Restore

Keys to appropriate electronic alerts



- **Efficiency**

- Should respect clinician's time

- **Usefulness**

- Must be accurate and relevant

- **User Interface**

- Should have right level of intrusiveness

- **Information Content**

- Should give right amount of information

- **Workflow**

- Must present at the right time in the visit

- **Communicate, Communicate, Communicate**

Patient Involvement

- Kp.org - Patient healthcare access site
 - General self help medical information
 - 40% of Membership
 - eMail you physician
 - eRefill prescriptions
 - “My Prescriptions” section
 - Shows current active prescriptions seen by all healthcare professionals within Kaiser-Permanente
 - 800 Telephone number to live pharmacist for medication questions

My Prescriptions

[My health manager](#) [Health & wellness](#) [Health plans & services](#) [Locate our services](#)

Your prescriptions

▢ Help

Related links:

☐ Drug encyclopedia

☐ Health encyclopedia

☐ My doctor

Keep track
of my prescriptions

[Printer-friendly version](#)

The prescription list below includes medications currently prescribed for you by a Kaiser Permanente practitioner. The list may not include medications that you fill outside of Kaiser Permanente pharmacies, or medications that you purchase over the counter.

ZILACTIN-B 10 % MM GEL

[About This Medication](#)

Instructions: Use As Directed

Prescribed by A X CEMD MD on 03/20/08

Prescription number: 6310054884

If you have specific questions about the information on this page, please call a pharmacy representative at 1-866-301-3480 (toll free).

For your convenience, [refill prescriptions](#) online. If your bottle says 0-refill, you can still request a refill.

ePrescribing - Caution

- Alert Fatigue
- Provider Acceptance
 - Engage **early** in process
 - Be responsive to need for change
- Not all ePrescribing is the same
 - Stand alone systems
 - Fax Interfaces
 - Some interfaces One-Way only
 - Many lack integration to Electronic Medical Record
 - Linkage of Inpatient vs. Ambulatory

Summary - ePrescribing

- Improves Medication Safety
- Opportunity to strategically focus decision support
 - Target high risk agents
- Supports safe prescribing across the continuum of care
- Caution with “Alert Fatigue”
- Huge Opportunity to involve patients